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Section of Environment, Energy, and Resources**

**Hot Topics: Indian Reserved Water Rights, Water Quality Trading, and the Public Trust
Doctrine**

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Although superficially disparate, each of the three “hot topics” I will address this morning is a legal response to pressure being placed on surface water and water-based resources. One, Indian reserved rights to water, is a prudential or judge-made doctrine that is over 100 years old, but until recently was never used in the east. Another, nutrient trading, is a relative new non-regulatory innovation under the federal Clean Water Act that appears to be taking a firm hold in the Chesapeake Bay even though there are both legal and practical questions associated with its use. While the third, the public trust doctrine, is a centuries old common law doctrine that re-emerged in this country in the mid-twentieth century. Government agencies and private parties have used the doctrine over the years, particularly in the East, to protect water-based resources from conversion to commercial uses and to assure public access to those resources. Each of these initiatives reflects a unique approach towards protecting eastern water and water-based resources from over-use, degradation, or conversion to another use. I will begin by providing you with some background information about the resources to which they are being applied, then describe the three approaches, how they are being used, and the controversy that surrounds their use, and conclude with my predictions about their future use.

A. A Depleted Resource

Since the 1980s, the East has been subject to increasing dry spells at the same time that the number of people living in riparian corridors has grown substantially.¹ The growing demand on riparian resources has stressed the capacity of the common law riparian doctrine, to allocate surface flow fairly and efficiently among users and at the same time preserve sufficient water to meet ecosystem needs.²

¹ See Hope M. Babcock, *Reserved Indian Water Rights in Riparian Jurisdictions: Water, Water Everywhere, Perhaps some Drops for Us*, 91 CORNELL L. REV. 1203, 1204, n.2 (2006) (providing support for the increasing scarcity of water generally, and in the East particularly).

² Babcock, *Reserved Indian Water Rights*, *supra* note __ at 1205. An example of this conflict is the dispute between Georgia, Alabama, and Florida over the waters in Lake Lanier which Alabama and Florida depend

In response to increasing consumption of surface water and the unanticipated problem of potential over consumption, many eastern states have incorporated features of the western appropriation doctrine into the riparian regime for managing surface flows.³ However, eastern water managers have generally overlooked Indian tribes when deciding who gets this water, despite the fact that many eastern tribes depend on the water in those rivers for food and income, as well as for cultural identity and ceremonial purposes. One such tribe is the Mattaponi Indian Tribe of Virginia whose reservation abuts the Mattaponi River and who has depended on that river for its shad fishery and other cultural and subsistence purposes for centuries. As the demands on surface water increase in the East, tribes like the Mattaponi, find themselves competing with powerful non-Indian interests for an increasingly scarce resource. The riparian regime, under which eastern tribes compete for water, is not favorable to their claims as they have no guaranteed or reserved right to that water unlike western tribes.

Indian reserved water rights originated in *Winters v. United States*, a case involving a claim by several Montana tribes to water that flowed past their reservation.⁴ The Court in *Winters* ruled that when the federal government established a reservation for the Fort Belknap tribes, it implicitly reserved water sufficient for the tribes' purposes.⁵ Over time, the federal courts expanded the doctrine announced in *Winters* to apply to non-Indian public lands and resources.⁶ Western tribes rarely asserted their reserved rights to water in the first half of the last century, but this is no longer so. The result is that unadjudicated *Winters* rights are a major source of uncertainty in the West as the disputes over water grow in frequency and intensity.⁷ Although federal courts have put severe constraints on the purposes to which tribes may apply their "Winters rights," *e.g.* limiting their use to agriculture and prohibiting their off-reservation transfer, these rights nonetheless have offered tribes access to water they might otherwise not have had in an increasingly competitive market for the resource.⁸

In a 2006 law journal article,⁹ I set out various arguments and theories as to why eastern tribes could assert reserved rights to water even though the tribes were not federally recognized and did not occupy federal reservations (two predicate facts for the assertion of reserved Indian water rights by tribes up to this point) and were not living in jurisdictions which employ the appropriation system for awarding rights to water (a system that relies on permitted, quantifiable, transferable property rights in water that can be allocated among competing users). In that piece, I argued that the *Winters doctrine*, as the reserved Indian right to water became to be known,

on for power generation, industry, recreation, and commercial fishing and Georgia for drinking water. Brenda Goodman, *Georgia Loses Federal Case in a Dispute About Water*, New York Times, A13 (February 6, 2008).

³ See generally Babcock, *Reserved Indian Water Rights*, *supra* note 1 at 1207-19 (discussing the three regimes for managing flow – riparianism, the prior appropriation doctrine, and regulated riparianism).

⁴ 207 U.S. 564 (1908).

⁵ 207 U.S. at 577.

⁶ See *Cappaert v. United States*, 426 U.S. 128, 147 (1976) (finding presidential proclamation establishing as a national monument a cavern that is home to a unique species of fish reserved sufficient water to protect the endangered fish); *Arizona v. California*, 373 U.S. 546, 595-601 (1963) (holding the federal government could assert reserved federal water rights on behalf of Indian reservations as well as wildlife refuges, national forests, and federal recreation areas)...*But see United States v. New Mexico*, 438 U.S. 696, 715-18 (1978) (limiting reserved federal water rights to only the primary purposes for which land was withdrawn).

⁷ Babcock, *Reserved Indian Water Rights*, *supra* note 1 at 1220-21.

⁸ See generally Babcock, *Reserved Indian Water Rights*, *supra* note 1 at 1228-33 (discussing the constraints on tribal assertions of their *Winters* rights).

⁹ Hope M. Babcock, *Reserved Indian Water Rights in Riparian Jurisdictions: Water, Water Everywhere, Perhaps some Drops for Us*, 91 CORNELL L. REV. 1203 (2006).

should be recognized in the East because the origins of the doctrine were in common law riparianism, the dominant method of regulating water in the East, that the purpose of tribal reserved water rights, as reflected in the Court's opinion in *Winters*, was to provide distributive justice to tribes, and that certain utilitarian benefits accrued from recognizing reserved Indian water rights, such as encouraging water conservation and helping to protect the environment because tribal uses generally depend on water not being diverted for offstream uses.

While I thought my arguments were theoretically persuasive, I never dreamed that a court would actually agree with me. But, in February of last year, a Virginia Circuit Court held that the Mattaponi Indian Tribe could assert a claim to reserved water rights in the river that bears the tribe's name.¹⁰ The court reasoned that even though the doctrine's preemptive force stemmed from its federal origins, nonetheless the reasoning that animated the *Winters doctrine* did not preclude the same reasoning "from potentially having an effect on the state level." The court also found "the idea that a state government may impliedly reserve sufficient water to achieve its goals for its resident Indian tribes" to be "undeniably compatible with the *Winters doctrine*."¹¹ Just as in *Winters*, the Virginia trial court opined that the Mattaponi could have impliedly negotiated to set aside sufficient water to sustain its reservation and protect its aboriginal practices. Although the state court was skeptical that an eastern tribe in a water-rich jurisdiction like Virginia could show it needed the reserved water, as required under both the *Winters* and riparian doctrines, nonetheless it specifically refrained from saying that showing could never be made.

The court ultimately found that the Mattaponi had not met its burden of showing necessity and, therefore, could not defend against the Commonwealth's demurrer. However, not before declaring that the "*Winters doctrine* effectively stands for the proposition that a government, as well as an Indian tribe, can impliedly reserve water for that tribe's sustenance and thereby override customary state water law, when *necessary* in light of inadequate protection offered by state water law," and further that "the inadequacy of riparian law could necessitate an implication that both a quantity and quality of water needed to achieve the purposes underlying an Indian reservation were reserved at the time of the Indian reservation's creation."

Although the ruling went largely unnoticed in environmental circles, it achieved instant notoriety in Indian Country as it was the first time that such a claim had been made on behalf of a non-federally recognized tribe in a riparian jurisdiction, let alone been recognized as viable by a state court judge. Therefore, I would be surprised if other eastern tribes did not attempt to make use of the doctrine. It is also conceivable that just as the *Winters doctrine* expanded over time to protect the water needs of other types of reserved western federal lands the concept of reserved Indian water rights may be expanded in the East to guarantee sufficient water not only for other federal reserved lands, but also for other types of state reserved lands.

B. A Degraded Resource

The quality of water in the Chesapeake Bay and its aquatic-based habitat has continued to decline despite millions of dollars as well as a significant amount of human capital being spent on

¹⁰ Mattaponi Indian Tribe, *et cal* v. Commonwealth of Virginia, *et al*, Circuit Court No. 3001-RW/RC (Feb. 5, 2007). The Institute for Public Representation, which I direct, represented the Mattaponi Tribe in this and other proceedings involving the City of Newport News' proposed construction of a drinking water reservoir near the Tribe's reservation.

¹¹ Mattaponi Indian Tribe, Circuit Court No. 3001-RW/RC at 15.

improving them.¹² Low oxygen levels, dead zones, algae blooms, loss of critical habitat for important commercial and recreational species, and declining populations of those species, continue to plague the Bay.¹³ According to a recent report by the Chesapeake Bay Program, “the overall ecosystem health of the Chesapeake Bay remains degraded . . . Major pollution reduction, habitat restoration, fisheries management and watershed protection actions taken to date have not yet been sufficient to restore the health of the Bay.”¹⁴ The only way to get clear and well-oxygenated water, which are vital for a vibrant Bay ecosystem, is to reduce the amount of algae and turbidity in the Bay.¹⁵

Nutrient enrichment is a source of algae and turbidity in many mid-Atlantic estuaries, including the Chesapeake Bay. Nutrients cause algal blooms that lower dissolved oxygen levels below those necessary for healthy aquatic life.¹⁶ Without sufficient dissolved oxygen underwater grasses, clams, and fish, cannot survive. Algal blooms also block sunlight from submerged aquatic vegetation (SAV), which inhibits photosynthesis and oxygen production, causing the algae, as well as the SAV, to die and decompose.¹⁷ As the SAV and algae decompose, they use dissolved oxygen that would otherwise be available to living organisms, further lowering dissolved oxygen levels and creating a positive feedback loop that reinforces the original cycle.¹⁸ Decomposition of organic matter uses oxygen that living organisms need to survive and contributes to the water's biological oxygen demand (BOD) level.¹⁹ The higher the BOD level of water, the less dissolved oxygen is available for living organisms. Decomposing algae also contribute to the water's turbidity, blocking sunlight and creating another destructive positive feedback loop.

Low dissolved oxygen levels and high turbidity harm the Bay's resident species and interfere with commercial and recreational fishing.²⁰ Non-mobile species, like clams, worms and the fish and crabs that feed on them, adversely affected by low dissolved oxygen levels must relocate to areas with higher dissolved oxygen levels or perish.²¹ Low dissolved oxygen levels and increased turbidity also kill vital bay grasses that provide food and shelter for aquatic

¹² See generally Hope M. Babcock, *Administering the Clean Water Act: Do Regulators Have “Bigger Fish to Fry” when it Comes to Addressing the Practice of Chumming on the Chesapeake Bay*, 21 TUL. L.J. 1, 9-13 (2007).

¹³ *Id.*

¹⁴ Chesapeake Bay Program, Chesapeake Bay 2005 Health and Restoration Assessment, Part One: Ecosystem Health 1 (Mar. 2006), http://www.chesapeakebay.net/pubs/2007reports/EPA06_BagHealthReport.pdf.

¹⁵ *Id.*

¹⁶ See generally Babcock, *Administering the Clean Water Act*, *supra* note 12 at 9-13. Reflecting the importance of dissolved oxygen (DO) and concerns about low levels of DO in Atlantic coastal waters, EPA has established dissolved oxygen water quality criteria from Cape Cod in Massachusetts to Cape Hatteras in North Carolina. EPA, AMBIENT LIFE WATER QUALITY CRITERIA FOR DISSOLVED OXYGEN (SALTWATER): CAPE COD TO CAPE HATTERAS (Nov. 2000), EPA-822-R-00-012, available at <http://www.epa.gov/waterscience/criteria/dissolved/docriteria.pdf>.

¹⁷ *Id.* at 10-11.

¹⁸ See Babcock, *Administering the Clean Water Act*, *supra* note 12 at 11, n. 57 (discussing positive feedback loops).

¹⁹ See *id.* at 11 n.58 (explaining biological oxygen demand).

²⁰ Excess total suspended solids and nutrient loadings can also reduce the average price of a house. See Linwood Pendleton, *the Economic and Market Value of Coasts and Estuaries: What's at Stake?*, 30 National Wetlands Newsletter 12-13 (Mar.-Apr. 2008) (saying one unit (mg/L) increase in turbidity negatively impacts the average housing price by \$1,086 and a similar increase in nutrients by \$17,642).

²¹ *Id.* at 12-13.

creatures, such as the blue crab and summer flounder as well as spawning and nursery habitat for fish and waterfowl.²²

The entire Maryland portion of the Bay has been impaired by excess nutrient pollution since 1996; little progress has been made in reversing that effect.²³ For example, the Chesapeake Bay Program reported that 2005 had the lowest readings of dissolved oxygen since 1993, with approximately 10% of the Bay recording dissolved oxygen levels approaching zero.²⁴ The volume of hypoxic and anoxic waters in the Bay has more than tripled over the past forty years, while the Bay's deep water dead zone, areas of the Bay with hypoxic or anoxic levels of dissolved oxygen, is expanding into major Bay tributaries like the Potomac River.²⁵ In July 2005, data from the Chesapeake Bay Program recounted that almost 40% of the Bay's main stem beginning at Baltimore and extending 100 miles south to Hampton Roads, Virginia, is now dead - "the largest area of oxygen depleted water seen since monitoring began 20 years ago."²⁶

Nutrient loadings to the Bay and its tributaries from farm fields and sewage treatment plants are the principal cause of low dissolved oxygen levels and high turbidity, but reducing, let alone eliminating, the problem is neither easy nor cheap. The Bay watershed states estimate that it will take billions of dollars to design and implement measures for farmers to prevent soil, manure, and fertilizers from washing off their fields into the Bay watershed and to upgrade sewage treatment plants.²⁷ An additional problem facing state and federal officials is that runoff from farm fields is not regulated under the Clean Water Act.²⁸ Few municipalities or counties have the resources to upgrade sewage treatment plants.

Out of a sense of frustration with the "command-and-control" approach of the major pollution control laws, as well as allegations of the approach's inefficiency, high cost, and barriers to innovation, economist since the 1970s have been urging the use of market-based mechanisms like emission trading programs as an alternative approach to controlling pollution. Initially proposed in Title IV of the Clean Air Act (CAA) for sulfur dioxide,²⁹ later by regulation for nitrogen oxide, and abortively mercury,³⁰ it would not take long for proponents of emission trading programs to propose its use for water pollution under the shadow of the Clean Water Act (CWA).³¹

²² *Id.* at 13.

²³ *Id.* at 11-12.

²⁴ *Id.* at 11.

²⁵ *Id.* at 12.

²⁶ *Id.* at 12.

²⁷ *Id.* at 13 n.78.

²⁸ 33 U.S.C. § 1251 *et. seq.*

²⁹ 42 U.S.C. §§ 7651 *et. seq.*

³⁰ EPA modeled both the nitrogen oxide and mercury trading rules on the sulfur dioxide trading program and implemented them under the Bush Administration's Clean Air Interstate Rule (CAIR) and Clean Air Mercury Rule, respectively. The legality of CAIR is pending before the D.C. Circuit (North Carolina v. EPA, D.C. Cir., No. 05-1244). The D.C. Circuit overturned the Mercury Rule in *New Jersey v. EPA*, D.C. Cir. No. 05-1097 (2/8/08). That decision is the subject of a petition for rehearing filed by EPA and the Utility Air Regulatory Group on March 24, 2008.

³¹ Water quality trading has been the subject of many articles, including, Joseph T. Braum, *Market by the Bay: A Market-Based Approach to Nutrient Pollution in the Chesapeake Bay*, 15 PENN. ST. ENVTL. REV. 131 (2006); Sarah Brull, *An Evaluation of Nonpoint Source Pollution Regulation in the Chesapeake Bay*, 13 U.Balt. J.Envntl. L. 221 (2006); Joel B. Eisen, *Rapanos, Carabell, and the Isolated Man*, 40 U. RICH. L. REV. 1099 (2006); Lynda Hall & Eric Raffini, *Water Quality Trading: Where Do We Go From Here?*, 20-SUM NAT. RESOURCES & ENV'T 38 (2005); Darin Michael Lowder, Casenote, *Strange Watershed Bedfellows? Will the EPA's Water Quality Trading Policy Encourage Unlikely Clean Water Alliances?*, 13

Generally, in water quality trading programs, the buyer is typically a permitted facility facing more stringent limitations and higher compliance costs, and the seller is an *unregulated* nonpoint source, most likely a farmer.³² In this scenario, tradable credits are generated by either a point source from “over-controlling” its discharges or a nonpoint source by installing best management practice beyond those required to meet baseline (the discharge level that applies if there is no trading).³³ Thus, a trade involves the voluntary exchange of pollution reduction credits during which sources with higher pollution control costs purchase pollutant credits from sources with lower control costs. The idea behind trading is that water quality goals for the receiving stream can be met at a lower cost than by installing new technology, so the discharger saves money, and the credit supplier gains revenue. In addition to the direct benefits that the trading partners receive, where the trade involves a nonpoint source, there can be indirect benefits from the installation of best management practices to control farm runoff (and earn tradable credits), such as reduced erosion, improved habitat and flood retention, restoration of wetlands, and the simultaneous control of other harmful pollutants like pesticides that might also be washing off of farm fields.

A key element of any water trading programs is a cap on the amount of pollution that can be emitted into the receiving environment. Once that number is established either through the TMDL process³⁴ or through some other mechanism, including allowing the pollution sources to allocate the loadings among themselves, units of pollution can be bought, sold, or traded by those who are using the resource as a waste disposal sink so long as the over all cap is met. “Cap-and-trade programs require only that for every unit of resource that you use, you must buy an entitlement – which is to say, you pay for someone else to stop polluting, in an amount equivalent to your pollution, so that the total capped resource remains the same.”³⁵

GEO. MASON L. REV. 411 (2005); Thomas K. Ruppert, *Water Quality Trading and Agricultural Nonpoint Source Pollution: An Analysis of the Effectiveness and Fairness of EPA’s Policy on Water Quality Trading*, 15 VILL. ENVTL. L.J. 1 (2004); Ann Powers, *The Current Controversy Regarding TMDLs: Contemporary Perspectives “TMDLs and Pollution Trading,”* 4 RES COMMUNES 2 (2002-2003); Kurt Stephenson, Leonard Shabman & L. Leon Geyera, *Toward and Effective Watershed-Based Effluent Allowance Trading System: Identifying the Statutory and Regulatory Barriers to Implementation*, 5 ENVTL. LAW. 775 (1999); Esther Bartfield, *Point-Nonpoint Source Trading: Looking Beyond Potential Cost Saving*, 23 ENVT. L. 43 (1993).

³² Trading is only one of several options for a discharger of nutrients when faced with a new or lower permit limit. Other options include pollution prevention, recycling or reusing the pollutants, or installing technology.

³³ For a nonpoint source, this assumes that the source is part of a TMDL and has received a load allocation. If there is no TMDL covering a nonpoint source then unless the state or local government has figured out what the baseline is for those sources and imposed best management practices to achieve it, the baseline would have to be calculated before any trade could take place involving a nonpoint source.

³⁴ Under this process, for streams that are exceeding water quality standards, the state calculates the total maximum daily load of the pollutants that are causing the standards to be exceeded and then allocates the burden of coming into compliance among the contributing sources. Administering this program requires monitoring and reporting as well as a cap on the total loadings for the stream. The TMDL must take account of the contribution from nonpoint sources; individual load allocations are incorporated into the permits of the contributing point sources. See 33 U.S.C. § 1313(d)(1) (TMDLs must be established for waters a state identifies for which “effluent limitations are not stringent enough to implement any water quality standard applicable to such waters”).

³⁵ Carol M. Rose, *Environmental Law Grows Up (More or Less), and what Science Can do to Help*, 9 LEWIS & CLARK L. REV. 273, 282 (2005). It is important to note, however, that the Clean Water Act, as distinguished from the Clean Air Act, contains a zero discharge goal, 33 U.S.C. 1251(a)(1). The Clean Water Act also has provisions that prevent a polluter from backsliding to a lower level of pollution

The U.S. Environmental Protection Agency issued a policy statement in January 1996 endorsing the use of effluent trading within watersheds.³⁶ Five months later, EPA supplemented its policy statement with a Draft Framework for Watershed Based Trading.³⁷ Among the principles that the Draft Framework set out was that trading participants must meet applicable effluent limitations, that trades must be consistent with water quality standards in the entire watershed, and that trades must be developed within a TMDL or other comparable analytical and management framework. In January 2003, EPA released a revised Water Quality Trading Policy Statement,³⁸ which among other things emphasized EPA's support for trading nutrients or sediment loadings, but declined to support trading other pollutants because they pose a higher risk of "hot spots" (concentrated areas of pollution) developing and require more scrutiny than might otherwise happen under a trading regime.³⁹ In the 2003 Trading Policy Statement, the agency changed its position on whether trading programs could be developed for waters where there is not yet a TMDL program in place.⁴⁰

Additional elements of EPA's recommended trading program include requiring that the program be specified in the facility's individual discharge permit and that compliance with the program be tracked through monthly discharge monitoring reports. Trading cannot be used to meet technology-based effluent limits, cause a water body to go out of attainment for a particular water quality standard,⁴¹ adversely affect water quality at a drinking water supply intake facility, or cause a cap established under a TMDL to be exceeded. EPA also "supports" public participating at the earliest stages and throughout the development of water quality trading program as well as easy and timely public access to information so the public can monitor trading activity.⁴² EPA suggests that watershed permits issued to point sources involved in a trading program should include more stringent facility specific effluent limits or other conditions that would come into effect, if the pollutant cap established by the general watershed permit is

removal, 33 U.S.C. § 402(o) and states from allowing their waters to degrade below a level of quality that they could otherwise achieve or have already achieved, 40 C.F.R. §§ 131.10, 131.11, 131.12.

³⁶ EPA, *Effluent Trading in Watersheds Policy Statement* ("EPA will actively support and promote effluent trading within watersheds to achieve water quality objectives, including water quality standards, to the extent authorized by the CWA and implementing regulations"), available at <http://www.epa.gov/EPA-WATER/1996/February/Day-09/pr-230.html>.

³⁷ EPA *Draft Framework for Watershed Based Trading* (May 30, 1996), 800R96001, available at <http://nepis.epa.gov/EPA/html/Pubs/puntitleOW.html>. The Draft Framework has never been finalized.

³⁸ EPA, *Water Quality Trading Policy Statement* (Jan. 30, 2003), 68 Fed. Reg. 1608 (Jan. 13, 2003), available at <http://es.epa.gov/ncr/events/calendar/2007/sep 26/finalpolicy2003.pdf>.

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ Water quality standards have three elements, designated uses, numeric criteria, and EPA's antidegradation policy that prevents states from downgrading a designated use once it has been achieved. 40 C.F.R. §§ 131.10, 131.11, 131.12.

⁴² Environmental Protection Agency Water Quality Trading One-Day Training Program at 7.9 (Washington, D.C., December 5, 2007) (in possession of author). Virginia had two public comment periods before issuing its water quality trading general permit in September 6, 2006. See State Board, *Notice of Intended Regulatory Action – Agency Background Document* (Apr. 13, 2005), available at http://www.townhall.state.va.us/I/GetFile.cfm?File=E.%5D////ctownhall%5Docroot%5C103%5C1737%5C3150%5CAgencyStatement_DEQ_3150_vl.pdf;Board, Fact Sheet – Issuance of a General VPDES Permit to Discharge to State Waters and State Certification under the State Water Control Law, available at <http://www.deq.state.va.us/vpdes/pdf/9VAC25-820-FactSheet.pdf>.

exceeded.⁴³ The agency recommends that there be periodic assessments of the environmental and economic effectiveness of trading programs. These assessments should include ambient monitoring of the affected water body as well as studies that document nonpoint source load reductions, validate nonpoint source removal efficiencies, and determine whether water quality standards are actually being met.⁴⁴

Although giving the outward appearance of “full-throated” support for water quality trading, a certain nervousness can be detected behind the agency’s endorsement in the particulars of its recommendations. With good reason because “uncertainties” as well as practical and legal questions abound in trading water pollutants.⁴⁵ For example, determining the appropriate trading ratio between the trading partners involves a host of variables and measurement uncertainties, especially when nonpoint sources are involved, including the distance between the buyer and seller, the distance from the source to the receiving water body, and equivalency among the pollutant forms.⁴⁶ When one of the trading partners is a nonpoint source, that source only generates *actual* pollution credits when it rains while the point source discharge creates a constant credit deficit from continuously discharging the pollutant. There will also be considerable uncertainty over the design, installation, maintenance, and effectiveness of proposed nonpoint sources controls and the extent to which previously unregulated (and usually politically powerful) farmers will consent to inspections by government agencies or trading partners who may be liable if the controls are not effective. Best management practices to reduce nonpoint source pollution may take several years before they are actually effective, during which time the point source is continuing to discharge perhaps above permitted limits. For all trading parties, whether point or non point sources, and for government agencies there are transaction costs involved in establishing and then administering a trading program, such as the cost of gathering information, negotiating the trade, implementing it and monitoring its performance.

Water quality trading programs also face an uncertain legal future because the CWA does not authorize trading, unlike the CAA. This creates serious legal risks for the permitted discharger if the Act’s requirements are not met. For example, because the CWA is silent on trading and the statute creates strict liability for any permittee discharging in violation of its permit, it would be a violation of the statute if a discharger uses trading to meet its permitted

⁴³ EPA *Water Quality Trading Policy Statement*, *supra* note 38 at 7.

⁴⁴ EPA Training Program, *supra* note 42 at 7.12.

⁴⁵ Several states, Connecticut (Long Island Sound), North Carolina (Neuse River), and Minnesota (Minnesota River) are implementing point-point source trades; Colorado (Cherry Creek, Dillon Reservoir, and Chatfield), Minnesota (Rahr Malting, Southern MN Beet Sugar Cooperative), Wisconsin (Red Cedar River), and Ohio (Miami River) are involved in point-nonpoint source trades, and New Jersey has established a pretreatment trading program (Passaic Valley Sewerage Commissioners). Local trading programs are under development on the Passaic River in New Jersey, Cape Fear River in North Carolina, Kalamazoo River, in Michigan, Bear River in Utah, Idaho and Wyoming, Lake Tahoe in California and Nevada, Lower Boise River in Idaho, and in the Willamette River Basin in Oregon. Watershed trading programs are in place in Connecticut for Long Island Sound, Virginia for the Chesapeake Bay, and in Delaware for Inland Bays. Michigan, Ohio, and Vermont have developed statewide regulatory trading frameworks; Colorado, Oregon, and Pennsylvania have statewide trading policies, Idaho has issued guidance, while Florida and Minnesota are developing trading regulations, and Maryland and Virginia are developing policies. A total of 106 NPDES permits allow trading veering 373 facilities, of which only 127 have actually participated in trades. Environmental Training Program, *supra* note 42 at 4.11-13.

⁴⁶ EPA Training Program, *supra* note 42 at 5.4.

technology or water quality-based effluent limitations in exchange for reductions elsewhere. There may be a legal argument that allowing a discharger to discharge at levels that exceed permitted limits through an offsetting trading program violates the CWA's "anti-backsliding" provisions, which prohibit changes to permits that weaken existing effluent limits.⁴⁷ There is also a practical concern that allowing a facility to continue to discharge in excess of its permitted limits would create "hot spots" in the receiving water body that could be a serious problem depending on where the discharging facility is located and might violate EPA's antidegradation policy.⁴⁸ With this background on water quality trading programs, let me return to the Chesapeake Bay and Virginia's nutrient trading program.

The Chesapeake Bay states and the District of Columbia entered into an agreement in 1983 to address the many sources of the problems I previously described.⁴⁹ The signatories amended the Agreement in 1987 specifically to address the problem of nutrient loadings and established a specific goal of attaining a 40% reduction in nitrogen and phosphorous in the Bay by 2000.⁵⁰ As it became clear to the signing parties that the 40% nutrient reduction goal would not be met, the signatories began to consider the possibility that trading might help achieve the goal, however, subject to certain limitations. Thus, trading would not be allowed for an individual source of nutrients unless the discharger had begun to implement the 40% goal; trading would only be allowed in the Bay's major tributaries; and the program as a whole would be subject to a permit, regulation or an agreement that incorporated protection and enforcement provisions similar to those that could be found in a discharge permit.⁵¹

In 2005, Virginia enacted the Chesapeake Bay Watershed Nutrient Credit Exchange Program to meet the 40% reduction goal established in the 1987 Bay Agreement.⁵² The law contains several features, which make it an interesting trading program to look at from both a practical and legal perspective.

One of these features is that Virginia's trading program is authorized by a general permit, as opposed to individual discharge permits.⁵³ Putting aside the legality of using general permits for trading programs,⁵⁴ the Virginia general permit, which covers all facilities already holding individual discharge permits containing effluent limits for the discharge of nutrients in five river basins,⁵⁵ specifically states that the numbers and requirements in the general permit shall preempt any other limits contained in those individual permits unless they are more stringent.⁵⁶ Since

⁴⁷ 33 U.S.C. §§ 303(d)(4) and 402(o).

⁴⁸ 33 U.S.C. § 303(c). and 40 C.F.R. Parts 122, 123, and 124.

⁴⁹ Chesapeake Bay Program, *1983 Chesapeake Bay Agreement*, available at <http://www.chesapeakebay.net/pubs/199.pdf>.

⁵⁰ Chesapeake Bay Program, *1987 Chesapeake Bay Agreement*, available at <http://www.chesapeakebay.net/pubs/1987ChesapeakeBayAgreement.pdf>.

⁵¹ Ann Powers, *The Current Controversy Regarding TMDLs: Contemporary Perspectives*, 4 VT. J. ENVTL. L. 1, 10 (2003).

⁵² Va. Code Ann. § 62.1-44.19:14. The Virginia State Water Control Board issued the general permit, on November 1, 2006.

⁵³ Virginia's authority to issue a general permit is found in the Virginia State Water Control Law §§ 62.1-44.15(5), (10), and (14) and authorizes general permits to cover one or more category of dischargers from point sources of treatment works. 9 Va. Admin. Code § 25-31-170.

⁵⁴ EPA authorizes the issuance of general permits under 40 C.F.R. § 122.28 even though the CWA only authorizes the use of general permits for the discharge of dredged or fill material, 33 U.S.C.A. § 1344(e), raising a serious question about how EPA is using general permits under the CWA.

⁵⁵ See 9 Va. Admin. Code § 24-720.

⁵⁶ Va. Code Ann. § 62.1-44.19:14(A) and (B).

there is no TMDL for the Chesapeake Bay, each facility is given an annual mass load allocation of total nitrogen and phosphorous. Those plants that cannot meet their allocation can purchase credits reflecting reductions in those pollutants from a point source discharger in the same watershed as long as the purchasing facility applies the credits in the same calendar year in which the excess discharged occurred.⁵⁷ New or expanded facilities acquire annual mass load allocations, not credits, to compensate for their noncompliance with their allocation from either a permitted facility in the same tributary or by paying for the application of best management practices to reduce nonpoint source nutrient loadings.⁵⁸ There are no specific numeric criteria driving individual discharger performance either through a discharge permit or a TMDL; rather credits or waste load allocations are determined for each tributary with all the previously described attendant uncertainty that that process entails. In addition, because the general permit preempts individual permits none of the other requirements specifically included in individual NPDES permits that are not part of the general permit, such as the CWA's antidegradation policy and anti-backsliding provisions, are required.

A second unique feature of the Virginia law is that if a discharger is unable to purchase a sufficient number of credits to come into compliance with its annual mass load allocations, it can purchase equivalent credits by paying into the state Water Quality Improvement Fund, the primary goal of which appears to be public education not pollution reduction.⁵⁹ By allowing dischargers to offset any discharge in excess of their total annual waste load allocations through payment into a fund, which may not result in proportional water quality improvements, the provision may violate the CWA's anti-backsliding prohibition, which prohibit weaker effluent limits than those in place under prior permit,⁶⁰ and may not protect designated stream uses, another statutory violation. There is no comparable provision in the CWA authorizing payment into a fund in lieu of controlling a discharge of pollutants, and to the extent the Virginia's law

⁵⁷ 9 Va. Admin. Code. § 25-820-10.. The process for determining the amount of the particular credit is complex and involves determining the difference between the waste load allocation for the facility, specified as an annual mass load of total nitrogen or phosphorous and the monitored annual mass loadings of those pollutants, where the latter is less than the former and where that difference is then adjusted by the applicable delivery factor expressed as pounds per year of delivered total nitrogen and phosphorous. 9 Va. Admin. Code § 25-820-10 (West 2007).

⁵⁸ Va. Code Ann. § 10.1-2117:15 (West 2007). New or expanded facilities who cannot acquire sufficient allocations from point or nonpoint sources may resort to "other means," upon approval by the state regulatory agency based on a showing that the facility has made a good faith effort to acquire the necessary allocation from a permitted facility or through the application of best management practices and that these allocations were not "reasonably available." Va. Code Ann. § 10.1-2117:15.B.2 (West 2007).

⁵⁹ This Fund contains appropriated money from the Virginia General Assembly and money from penalties and damages and is to be used to educate people about point and nonpoint source pollution prevention, reduction and control programs. For a nutrient discharger to be able to take advantage of the Fund as a source of credits, there must be sufficient credits in the Fund for that year to cover the discharger's shortfall; otherwise there will be no credits for the facility to purchase. 9 Va. Admin. Code § 25-820-10.1-2128 (West 2007). *But see* § 62.1-44.19:18B)(2) (any payments to the Fund must be "promptly applied to achieve equivalent point or nonpoint source reductions in the same tributary beyond those reductions already required or funded under federal or state law, of the Virginia tributaries strategies plan. Dischargers must pay \$11.06/lb of nitrogen and \$5.04/lb of phosphorous. 9 Va. Admin. Code 25-820-70(J)(3). However, since the actual point source reductions need not occur until June of the year following the violation, may have no effect on localized water quality problems.

⁶⁰ The two exceptions to this prohibition do not seem to be implicated here as there has been no demonstration yet the revised effluent limitation will assure attainment of water quality standards nor that these changes to waste load allocations will be consistent with EPA's antidegradation policy. 33 U.S.C. §§ 1313(d)(4)(A) and 1313(d)(4)(B).

establishes a lower threshold of control than required by the CWA, it violates the federal statute.⁶¹

Another interesting aspect of Virginia's program is that the general permit does not demand compliance with the nutrient load allocations until January 1, 2011, five years after the permit came into effect, suspending all individual permit limits and compliance schedules for five years unless they are more stringent.⁶² Additionally, the effectiveness of the trading program is averaged over a year, allowing periods in which there can be excessive point source nutrient loadings as long as those periods are offset by over-controlling at the end of the year. Those high loading periods could occur when the receiving waters are especially stressed, such as during the summer when nutrient loadings from farm fields are higher and dissolved oxygen levels are correspondingly lower. Another problem is that the program may encourage the creation of hot spots in a tributary where discharged nutrients would not be mitigated by downstream reductions or by upstream reductions that are too far removed from the source.

A final interesting facet of Virginia's trading program is that the exchange of credits is directly controlled by the dischargers through a non-stock corporation, the Virginia Nutrient Credit Exchange Association.⁶³ Among things that the Association is tasked with doing include the submission of a compliance plan on behalf of the dischargers to the state regulatory agency, assisting dischargers in identifying buyers or selling of credits, coordinating planning to be sure that there are sufficient credits in any given year, and generally doing whatever is necessary to be sure that the credit exchange program is effective and efficient. Compliance plans submitted by dischargers must contain the capital projects and implementation schedules required to come into compliance with the facility's individual load allocation.⁶⁴

Although EPA is a big booster of water quality trading, trading has been slow to take hold, perhaps because of compliance uncertainties, transaction costs, and, in some cases, reduced economic benefit where dischargers have already spent money to upgrade their facilities. Additionally, the uncertainties associated with point-nonpoint trades – *i.e.* getting the calculations right, assuring that controls are effective, implemented and maintained – as well as the cost of monitoring nonpoint source compliance and the consequences for the point source should the nonpoint source not perform as expected, may make these, the most common and useful of potential trades, sufficiently unattractive to the potential trading partners to discourage their use.⁶⁵ Trading may be, especially unattractive to nonpoint sources who will be subjecting themselves to regulation – monitoring, perhaps enforcement – for the first time. Finally, there are legal risks to trading programs that do not meet the minimum requirements of the CWA both for the states that implement these programs and the facilities that execute trades under them. Nonetheless, it is safe to predict that water quality trading will not go away, and the only question is the extent to

⁶¹ 33 U.S.C. § 1370 (prohibiting states from adopting or enforcing any effluent limitation or standard that is less stringent than the extant federal limitation or standard).

⁶² 9 Va. Admin. Code § 25-820-10; 9 Va. Admin. Code § 25-820-30.C (West 2007).

⁶³ Va. Code Ann. § 62.1-44.19:17 (West 2007).

⁶⁴ Va. Code Ann. § 62.1-44.19:14.C.3 (West 2007).

⁶⁵ Reflecting these uncertainties, EPA has recommended a greater than 1:1 trade ratio for any trades involving nonpoint sources as well as on-site verification of BMPs and monitoring of flows, use of conservative demonstrated performance values, and site-specific discount factors. EPA Training Course, *supra* note 42 at 7.6. Some states in addition, like Ohio, have required that there be continuous flow monitor at the bottom of the watershed and nutrient monitoring sites at the mouth of each sub-watershed as well as an insurance pool to provide back-up credits if the BMPs fail; while Minnesota requires that an auditor certify implementation of BMPs. *Id.*

which EPA will allow states, like Virginia, to depart from its recommended programmatic features and legal requirements, in the interests of encouraging trading to occur.

C. An Over-used Resource

Americans are loving their coastal and estuarine waters to death. More than half of our population live and work within 50 miles of the coastline;⁶⁶ on average, 3,600 people per day move to coastal communities.⁶⁷ Forty percent of new commercial development and 46% of new residential development happens near our coasts.⁶⁸ Over 43% of adult Americans visit a sea coast or estuary at least once a year for recreational purposes.⁶⁹ Yet coastal areas comprise only 11% of the nation's land base,⁷⁰ and estuaries 13%.⁷¹ Incessant demands on coastal resources from population growth and commercial uses have severely strained those resources and the capacity of the legal system to protect them.

Our coasts, estuaries, and their watersheds as well as nearshore waters contain diverse habitats that performs many and varied functions of substantial benefit to humans and the species that depend upon them for some portion of their life cycle. These areas absorb and buffer the force of storm surges, filter pollutants, provide spawning grounds, nurseries, shelter, and food for marine and estuarine life that in turn support commercial and recreational fisheries,⁷² including a disproportionate number of rare and endangered species. While many of the development activities in these areas convey direct benefits to people, such as dredging rivers and harbors for navigational purposes,⁷³ placing support facilities for off- and near-shore oil and gas development on the coast,⁷⁴ converting forested areas and wetlands for farming and development, and building flood control dams and hydroelectric plants, these activities directly and indirectly degrade coastal and estuarine habitat and stress the species that depend upon them. Vast amounts of wetland acreage has been lost or significantly degraded as have mangrove forests, sea grass beds, and coral reefs as a result of coastal development.⁷⁵ Climate change, rising global temperatures, and sea-level rise are beginning to place added stress on the coastal environment

Although there is a tangle of overlapping federal, state, and local laws that address many of these threats to coastal habitats, there are gaps in this legal framework that the common law doctrines can fill. One such doctrine is the public trust doctrine, an august common law property

⁶⁶ U.S. COMMISSION ON OCEAN POLICY, *An Ocean Blueprint for the 21st Century*, Final Report 14 (2007).

⁶⁷ *Id.* at 14.

⁶⁸ *Id.*

⁶⁹ Pendleton, *What's at Stake?*, *supra* note 20 at 11.

⁷⁰ National Oceanic and Atmospheric Administration, Ocean Facts on Coastal Development, <http://www.yoto98.noaa.gov/facts/devel.htm> (last visited Mar. 19, 2008).

⁷¹ Pendleton, *What's at Stake*, *supra* note 20 at 11.

⁷² EPA estimates that almost 75% of the commercial fish landings, valued at over \$3.8 billion unprocessed, are estuarine dependent. *Id.* at 12.

⁷³ In 2003, more than \$841 billion in trade passed through a United States' port. Pendleton, *What's at Stake?*, *supra* note 20 at 12.

⁷⁴ Approximately 30% of the country's crude oil production, 20% of its natural gas production, and in excess of 45% of petroleum refining capacity is within the Gulf of Mexico's coastal zone. Pendleton, *What's at Stake?*, *supra* note 68 at 12.

⁷⁵ More than 50 percent of the historical sea grass cover has been lost in Tampa Bay, 76 percent in the Mississippi Sound, and 90 percent in Galveston Bay. Extensive sea grass losses have also occurred in the Chesapeake Bay, Puget Sound, San Francisco Bay, and Florida's coastal waters. U.S. COMMISSION ON OCEAN POLICY, *An Ocean Blueprint for the 21st Century*, Final Report 41 (2007).]

doctrine with roots in Roman law⁷⁶ that has been recognized in the United States since the early nineteenth century.⁷⁷ The public trust doctrine is based on the proposition that the sovereign holds certain common properties in trust in perpetuity for the free and unimpeded use of the public. Since public access to public trust resources is at the core of the doctrine, “absolute private dominion over property impressed with the public trust can never be granted unless it is in the public interest to do so”⁷⁸ because private ownership is usually inconsistent with public access. At its core, therefore, the public trust doctrine protects public rights in trust resources and prevents the government or private individuals from alienating or otherwise adversely affecting those rights. “The State can no more abdicate its trust over property in which the whole people are interested, like navigable waters and the soils under them, so as to leave them entirely under the use and control of private parties . . . than it can abdicate its police powers in the administration of government and the preservation of the peace.”⁷⁹

Professor Joseph Sax re-deployed the near dormant doctrine in a 1970 article, in which he suggested it be used to deal with a variety of environmental harms not yet addressed by Congress.⁸⁰ Since then, despite the alphabet soup of federal and state environmental laws, the doctrine has been widely employed to protect natural resources from commercial development and to assure public access to those resources.⁸¹ One important aspect of any common law doctrine, like the public trust doctrine, is that it evolves and changes to reflect community standards.⁸² Thus the doctrine has expanded over time to protect an array of different uses including some that are land-based resources, as well as instream flows,⁸³ wetlands, mudflats, and inter-tidal waters, and uses of those resources, including recreation, bird watching, and scientific

⁷⁶ THE INSTITUTES OF JUSTINIAN 90 (Thomas Collett Sandars trans, Longmans, Green & Co. (1905), cited in Timothy Mulvaney & Brian Weeks, “Waterlocked”: *Public Access to New Jersey’s Coastline*, 34 Ecology L.Q. 579, 582 (2007).

⁷⁷ See e.g. *Arnold v. Mundy*, 6 N.J. 1 (1821); *Martin v. Waddell’s Lessee*, 41 U.S. (16 Pet.) 367 (1842); *Shively v. Bowlby*, 152 U.S. 1 (1894).

⁷⁸ *Illinois Central R.R. Co. v. Illinois*, 146 U.S. 387, 433 (1892).

⁷⁹ See e.g. *Illinois Central R.R. Co.*, 146 U.S. at 453. Under limited circumstances public trust resources can be conveyed to private hands, if the alienation serves the public interest without harming trust uses in the remaining land, *Illinois Cent. R.R.*, 146 U.S. at 453., and there can be private title in trust resources as long as the private use of trust resources is consistent the trust’s purposes, does not interfere with uses protected by that doctrine, and will preserve those purposes for both present and future generations, *id.*.

⁸⁰ Joseph L. Sax, *The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970).

⁸¹ On the origins and uses of the public trust doctrine, see generally Hope M. Babcock, *Does Lucas v. South Carolina Coastal Council Protect Where the Wild Things Are? Of Beavers, Bob-O-Links, and Other Things that Go Bump in the Night*, 85 IOWA L. REV. 849 (March 2000); Hope M. Babcock, *Has the Supreme Court Finally Drained the Swamp of Takings Jurisprudence: The Impact of Lucas v. South Carolina Coastal Council on Wetlands and Coastal Barrier Beaches*, 19 HARV. ENVTL. L. REV. 1 (1995); Hope M. Babcock, *Grotius, Ocean Fish Ranching, and the Public Trust Doctrine: Ride ‘Em Charlie Tuna*, 26 STAN. L. REV. 3 (2007).

⁸² *Borough of Neptune City v. Borough of Avon-by-the-Sea*, 294 A.2d 47, 47 (N.J. 1972); see also John A. Humback, *Evolving Thresholds of Nuisance and the Takings Clause*, 18 COLUM. J. ENVTL. L. 1, (1993) (criticizing the *Lucas* Court for relying on indeterminate, judge-made common law doctrines like nuisance).

⁸³ *National Audubon Soc’y v. Superior Court of Alpine County*, 658 P.2d 709 (Cal. 1983) (applying the public trust doctrine to stop Los Angeles from diverting a non-tidal tributary of an inland lake).

study, even portaging across private property to avoid rocks in a non-tidal river.⁸⁴ However, the doctrine's most frequent use has been to protect coastal resources.⁸⁵

Although courts vary in the standards they use to evaluate the permissibility of transferring trust resources to private holdings,⁸⁶ all courts closely scrutinize these transfer to determine if there is any diminution in the land's use for trust purposes and generally look askance upon any governmental conduct that reallocates a public resource to a more restricted use or converts a public use to the self-interested use of a private party.⁸⁷ While the doctrine places what can be an unexpected constraint on the right of coastal and estuarine landowners to develop or use their land and may require them to allow reasonable public access to their land, these same owners receive a reciprocal benefit from the location of their land and the public funds that are spent on maintaining that private investment.⁸⁸

The public trust doctrine has lost none of its vitality over the centuries, especially in coastal areas.⁸⁹ For example, reflecting the importance of public access to coastal areas, the New Jersey Supreme Court in 2005, in *Raleigh Avenue Beach Ass'n v. Atlantic Beach Club, Inc.*,⁹⁰ held that the public trust doctrine applied to public access to the ocean through private property. Consistent with what is a long line of cases, in 2004 the Louisiana Supreme Court, in *Avenal v. State*,⁹¹ invoked the public trust doctrine to defeat a takings claim levied against the state for constructing a water diversion project even though the project basically destroyed the value of affected oyster leases because the project would forestall coastal erosion. According to the Louisiana court, compensation is not owed when the state's action is consistent with background principles of state property law that blocked the property owner from undertaking the actions he asserts were taken because he never had the right to undertake those uses in the first place. Similarly, in *McQueen v. South Carolina*,⁹² the South Carolina Supreme Court in 2003 relied on the public trust doctrine to defeat a takings claim brought by a landowner who wanted to develop his beachfront property in violation of a state law protecting the state's coastline from

⁸⁴ See generally Babcock, *Wetlands and coastal barrier Beaches*, *supra* note 81 at 40-49 (discussing a variety of uses of the public trust doctrine).

⁸⁵ Most states extend public ownership in tidal water up to the mean high or low water lines, although a few states like Delaware, Maine, Massachusetts, New Hampshire, and Virginia are "low water states," meaning that the state owns the submerged lands that extend seaward of the mean, and some states like New Jersey and Oregon grant the public rights to the shore above the high watermark. Mulvaney & Weeks, "Waterlocked," *supra* note 76 at 584-85; see also *Matthews v. Bay Head Improvement Ass'n*, 471 A.2d 355, 365 (N.J. 1984) (granting public access to the beach above the high watermark).

⁸⁶ Babcock, *Ocean Ranching*, *supra* note 81 at 50-51 (discussing the different approaches courts take to this question).

⁸⁷ Sax, *Public Trust*, *supra* note 80 at 490.

⁸⁸ Mulvaney & Weeks, "Waterlocked," *supra* note 76 at 613-14 (discussing the public funds that are expended on activities like beach replenishment, building seawalls and groins, maintaining public roads, potable water and other expensive infrastructure in coastal areas, among others). See also Pendleton, *What's at Stake?*, *supra* note 20 at 12 (noting that "beachfront proximity" increased a home's value by 207% compared to a house two blocks away; while location on an estuary added 73% to the property's value).

⁸⁹ For a comprehensive discussion of modern uses of the public trust doctrine in New Jersey as well as its use in the state's early history, see Mulvaney & Weeks, "Waterlocked," *supra* note 76.

⁹⁰ 879 A.2d 112 (N.J. 2005).

⁹¹ 886 So. 2d 1085 (La. 2004). See also John J. Costonis, *Two Years and Counting: Land Use and Louisiana's Post-Katrina Recovery*, 68 LA. L. REV. 349, 366 (2008).

⁹² 354 S.C. 142, 580 S.E.2d 116 (2003).

development. And again, in the 2005 remand of *Palazzolo v. Rhode Island*,⁹³ the Rhode Island Superior Court invoked the public trust doctrine in support of its finding that the property owner had not suffered a compensable taking when he was prohibited from developing the part of his property that fell below the mean high water line, noting that the doctrine gave the state an irrevocable trust in those lands.⁹⁴

The public trust doctrine is an infinitely malleable legal doctrine; its capacity to protect coastal and estuarine resources from harm undiminished by either the passage of time or laws. The success with which the doctrine has been used, especially along the Atlantic coast where its colonial roots are strong, suggests it will have a busy future as pressures on these resources increase and the effects of global warming are felt.

Conclusion

If there is one conclusion that can be drawn about all three of these “hot topics” is that they reflect the law’s creativity and plasticity. Whether it’s taking older doctrines like *Winters* or the public trust and applying them in new ways or creating an entirely new approach to solve a recurrent problem, water quality trading, the law (and lawyers) are never static. Just as assuredly, each new application of the public trust or the reserved water rights doctrine will be met with opposition, requiring court intervention, and each totally new idea, like pollution trading, that alters the expected paradigm for solving a problem will generate detractors. While all new ideas are not necessarily good any more than all new uses of old ideas are necessarily bad, nonetheless only by trying will we advance the law. Given the stakes involved in each situation where the tactic has been tried, whether it is an eastern tribe that can no longer subsist on its lands as it has for hundreds of years, an intact important ecosystem that is dying before our eyes, or a resource that is under threat from so many different sources that it defies the ability of our laws to protect it adequately, we have no other choice but to try.

⁹³ No. WM 88-0297, 2005 WL 1645974 (R.I. Super. 2005). *See generally* Michael C. Blumm and Sherry L. Bosse, Justice Kennedy and the Environment: Property, States’ Rights, and a Persistent Search for Nexus, 82 Wash. L. Rev. 667 (2007); Robert L. Bunting, Esq., *Average Reciprocity of Advantage: Magic Words of Economic Reality – Lessons from Palazzolo*, SN005 ALI-ABA 333 (2007).

⁹⁴ *Palazzolo*, No. WM 88-0297, 2005 WL 1645974 *12-14 (R.I. Super. 2005).